

Arizona CTE Career Preparation Standards Framework for AUTOMOTIVE COLLISION REPAIR

This is a summary of changes made to the program framework dated January 2006. Workplace Standards 1 through 26 will be addressed separately. Other changes to the original framework are outlined below:

- Standard 27.A has been renamed **Standard A**. The measurement criteria listed under the standard have been renumbered (1-61).

The words **Caulking/Seam Sealing** has been added to measurement criteria 27.22b, and the words **and destructive** have been deleted from measurement criteria 27.53b in Standard A.

- Standard 28.A has been renamed **Standard B**. The measurement criteria listed under the standard have been renumbered (1-82) with no deletions or additions.

Measurement criteria 7 and 8 were added to Standard B.

7. Lifting, raising, and supporting vehicles.

8. Disable and disarm airbags (SRS)

The word **sprayable** was added and the words **caulking, and seam sealers** were deleted from measurement criteria 28.26b.

The words **on adjacent panels** were added to measurement criteria 28.54b.

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STANDARD A -- PERFORM NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)	
1	Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan.
2	Inspect, remove, store, and replace exterior trim and moldings.
3	Inspect, remove, store, and replace interior trim and components.
4	Inspect, remove, store, and replace non-structural body panels and components that may interfere with or be damaged during repair.
5	Inspect, remove, store, and replace all vehicle mechanical and electrical components that may interfere with or be damaged during repair.
6	Protect panels, glass, and parts adjacent to the repair area.
7	Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants from those areas to be repaired.
8	Remove corrosion protection, undercoatings, sealers, and other protective coatings necessary to perform repairs.
9	Inspect, remove, and replace repairable plastics and other components that are recommended for off-vehicle repair.
10	Apply safety procedures associated with vehicle components and systems according to manufacturers specifications/procedures.
11	Apply environmental practices associated with vehicle components and systems such as substrates, fluids, refrigerants, batteries, etc.
12	Determine the extent of direct and indirect damage and direction of impact; develop and document a repair plan.
13	Inspect, remove and replace bolted, bonded, and welded steel panel or panel assemblies.
14	Determine the extent of damage to aluminum body panels; repair or replace in accordance with manufacturer's specifications.
15	Inspect, remove, replace, and align hood, hood hinges, and hood latch.
16	Inspect, remove, replace, and align deck lid, lid hinges, and lid latch.
17	Inspect, remove, replace, and align doors, tailgates, hatches, lift gates, latches, hinges, and related hardware.

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18	Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware.
19	Inspect, remove, replace and align front fenders, headers, and other bolted panels.
20	Straighten and rough-out contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pull attachments.
21	Weld damaged or torn steel body panels; repair broken welds.
22	Restore corrosion protection. Caulking/Seam Sealing
23	Replace door skins according to manufacturer's procedures.
24	Restore sound deadeners and foam materials.
25	Perform panel bonding according to manufacturer's specifications.
26	Diagnose and repair water leaks, dust leaks, and wind noise.
27	Remove paint from the damaged area of a body panel.
28	Locate and reduce surface irregularities on a damaged body panel.
29	Demonstrate hammer and dolly techniques.
30	Heat shrink stretched panel areas to proper contour according to manufacturer's specifications.
31	Cold shrink stretched panel areas to proper contour.
32	Mix body filler.
33	Apply body filler; shape during curing.
34	Rough sand cured body filler to contour; finish sand.
35	Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.

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36	Diagnose and repair water leaks, dust leaks, and wind noises; inspect, repair, and replace weather-stripping.
37	Inspect, repair or replace, and adjust removable, manually or power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs.
38	Inspect, remove, reinstall, and align convertible top and related mechanisms.
39	Identify weldable and non-weldable materials used in collision repair.
40	Weld and cut high-strength steel and other steels using manufacturer's specifications/procedures.
41	Weld and cut aluminum using manufacturer's specifications/procedures.
42	Determine the correct welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation.
43	Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the material being welded.
44	Store, handle, and install high-pressure gas cylinders.
45	Determine work clamp (ground) location and attach.
46	Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.
47	Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.
48	Protect computers and other electronic control modules during welding procedures according to manufacturer's specifications.
49	Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required.
50	Determine the joint type (butt weld with backing, lap, etc.) for weld being made according to manufacturer's/industry specifications.
51	Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation according to manufacturer's/industry specifications.
52	Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and lap joints.
53	Perform visual tests on each weld type.

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54	Identify the causes of various welding defects; make necessary adjustments.
55	Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.
56	Identify cutting process for different materials and locations in accordance with manufacturer's procedures; perform cutting operation.
57	Identify the types of plastics; determine repairability.
58	Identify the types of plastics repair procedures; clean and prepare the surface of plastic parts.
59	Replace or repair rigid, semi-rigid, and flexible plastic panels according to manufacturer's/industry specifications.
60	Remove or repair damaged areas from rigid exterior sheet-molded compound (SMC) panels.
61	Replace bonded sheet-molded compound (SMC) body panels; straighten or align panel supports.
STANDARD B -- PERFORM PAINTING AND REFINISHING OF VEHICLES	
1	Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations.
2	Identify safety and personal health hazards according to OSHA guidelines and the "Right to Know Law".
3	Inspect spray environment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards.
4	Select and use the NIOSH approved personal sanding respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.
5	Select and use the NIOSH approved (Fresh Air Make-up System) personal painting/refinishing respirator system. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.
6	Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye and ear protection, etc.).
7	Lifting, raising, and supporting vehicles.
8	Disable and disarm airbags (SRS).

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9	Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation.
10	Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. b
11	Inspect and identify substrate, type of finish and surface condition; develop and document a plan for refinishing using a total product system.
12	Remove paint finish in accordance with manufacturer's recommendations.
13	Dry or wet sand areas to be refinished.
14	Featheredge damaged areas to be refinished.
15	Apply suitable metal treatment or primer in accordance with total product systems.
16	Mask and protect other areas that will not be refinished.
17	Mix primer, primer-surfacer or primer-sealer.
18	Apply primer onto surface of repaired area.
19	Apply two-component finishing filler to minor surface imperfections.
20	Dry or wet sand area to which primer-surfacer has been applied.
21	Dry sand area to which two-component finishing filler has been applied.
22	Remove dust from area to be refinished, including cracks or moldings of adjacent areas.
23	Clean area to be refinished using a final cleaning solution.
24	Remove, with a tack rag, any dust or lint particles from the area to be refinished.
25	Apply suitable sealer to the area being refinished when sealing is needed or desirable.
26	Scuff sand to remove nibs or imperfections from a sealer.

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27	Apply stone chip resistant coating.
28	Restore sprayable corrosion-resistant coatings, to repaired areas.
29	Prepare adjacent panels for blending.
30	Prepare plastic panels for refinishing.
31	Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, and spray environment).
32	Check and adjust spray gun operation for HVLP (high volume, low pressure) or LVLP (low volume, low pressure) guns.
33	Set-up (fluid needle, nozzle, and cap), adjust, and test spray gun using fluid, air, and pattern control valves.
34	Determine type and color of paint already on vehicle by manufacturer's vehicle information label.
35	Shake, stir, reduce, catalyze/activate, and strain paint according to manufacturer's procedures.
36	Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.
37	Apply selected product on test and let-down panel in accordance with manufacturer's recommendations; check for color match.
38	Apply single stage topcoat for refinishing.
39	Apply basecoat/clearcoat for panel blending or partial refinishing.
40	Apply basecoat/clearcoat for overall refinishing.
41	Denib, buff, and polish finishes where necessary.
42	Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures.
43	Refinish rigid, semi-rigid and flexible plastic parts.
44	Apply multi-stage (tricoat) coats for panel blending or overall refinishing.

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45	Identify and mix paint using a formula.
46	Identify poor hiding colors; determine necessary action.
47	Tint color using formula to achieve a blendable match.
48	Identify alternative color formula to achieve a blendable match.
49	Identify blistering (raising of the paint surface); determine the cause(s) .
50	Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition.
51	Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition.
52	Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition.
53	Identify lifting; determine the cause(s) and correct the condition.
54	Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition.
55	Identify orange peel; determine the cause(s) and correct the condition.
56	Identify overspray on adjacent panels; determine the cause(s) and correct the condition.
57	Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition.
58	Identify sags and runs in paint surface; determine the cause(s) and correct the condition.
59	Identify sanding marks (sandscratch swelling); determine the cause(s) and correct the condition.
60	Identify contour mapping (shrinking and splitting) while finish is drying; determine the cause(s) and correct the condition.
61	Identify color difference (off-shade); determine the cause(s) and correct the condition.
62	Identify tape tracking; determine the cause(s) and correct the condition.

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63	Identify low gloss condition; determine the cause(s) and correct the condition.
64	Identify poor adhesion; determine the cause(s) and correct the condition.
65	Identify paint cracking (crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition.
66	Identify corrosion; determine the cause(s) and correct the condition.
67	Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition.
68	Identify water spotting; determine the cause(s) and correct the condition.
69	Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition.
70	Identify finish damage caused by airborne contaminants (acids, soot, and other industrial-related causes); correct the condition.
71	Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition.
72	Identify chalking (oxidation); determine the cause(s) and correct the condition.
73	Identify bleed-through (staining); determine the cause(s) and correct the condition.
74	Identify pin-holing; determine the cause(s) and correct the condition.
75	Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition.
76	Identify pigment floatation (color change through film build); determine the cause(s) and correct the condition.
77	Measure mil thickness.
78	Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.
79	Buff and polish finish to remove defects as required.
80	Clean interior, exterior, and glass.
81	Clean body openings (door jambs & edges, etc.).
82	Remove overspray.